

said laminating film contains a multiplicity of scores on at least one surface.

- B. A first sheet of a glass on a side of said laminating film having scores, and
- C. A second sheet of glass having a thickness of about 0.5 to 1.5 mm on the other side of the laminating film.

21. The assembly of claim 20 wherein said laminating film comprises an extruded copolymer of ethylene and methacrylic or acrylic acid neutralized from 40 to 90% with a sodium or potassium cation.

Remarks

Applicants confirm the election of the subject matter of Group II, with traverse.

Claim 14 relates to a laminate which comprises a laminating film which is an ionomer containing 13 to 22% by weight of a partially neutralized alpha olefin carboxylic acid which has a clarity of greater than 95%. A critical component to obtain the greater than 95% optical clarity is the ratio of the diamine to the degree of neutralization to obtain the Tg less than 210° F., and that the ionomer contains 13 to 22% by weight of alpha olefin carboxylic acid. The preferred acids are acrylic and methacrylic acids.

Claims 20 and 21 are directed to the assembly prior to laminating wherein scores are placed on the laminating film to prevent bubbles and to more effectively remove gases during amination. Scoring provides an improvement over embossing since it provides a flat surface and does not produce both peaks and valleys.

The Rejection Under 35 USC 103(a)

Reconsideration is respectfully requested of the rejection of the claims as now presented as being unpatentable over Clock et al in view of Hopfe and further in view of Smith and Murase et al or Bolton '346 or '228 in view of Clock et al.

Clock et al relates to laminates having good impact resistance which preferably contains a multilayered interlayer. The ionomers comprise unsaturated carboxylic acid in the amount of 0.5 to about 25 weight percent and the Examples 1-9 use only 10% by weight methacrylic acid containing ionomers as controls. Each of the controls failed when the ionomer alone was used. (See Table I at column 11). It was only when a block copolymer was used as a load distribution layer that there were satisfactory results.

Consequently, Clock et al teaches away from the presently claimed invention and provides a large catalog of ingredients which include ranges outside of the invention so

that one skilled in the art could not arrive at the present invention without undue experimentation. Moreover, Clock et al is silent with regard to the assembly of claims 20 and 21.

Hopfe teaches the use of a combination of identical shaped embossments and irregular peaks and valleys on a thermoplastic interlayer which does not include an ionomer. It is the different profiles which provide the improvements. One in the art would not score according to applicants' teachings since scoring provides regularity. Consequently, the reference teaches away from scoring (see column 7, lines 29-32).

It can be seen that both Clock et al and Hopfe teach away from the presently claimed invention. Hopfe does not disclose a copolymer of an olefin and alpha olefin carboxylic acid as claimed by Applicants. The copolymers of Hopfe include an ester which causes clouding. Also, PVB is preferred by Hopfe.

With regard to Murase et al, the Examiner errs that an ethylene methacrylic acid copolymer is disclosed at column 7. Not a single carboxylic acid is disclosed. There is mentioned esters, amides, nitriles, and vinyl ethers.

Consequently, Murase et al is not pertinent to the present invention.

Each of Smith and Bolton et al are owned by the Assignee of the present invention and have only recently been able to define the critical parameters to provide an improved anti-spalling laminate. Each of the references fails to teach or suggest the critical ranges of 13 to 22% by weight partially neutralized unsaturated dicarboxylic acid. It is this range which results in >95% clarity.

Smith merely teaches the use of diamines to achieve clarity. There is no mention of the range for neutralized unsaturated dicarboxylic acid which is critical in the present invention. The diamine is not critical in the present invention.

Both of the Bolton references are jumping off places for the present invention in that ionomers are disclosed which contain diamines. However, the references teach away from anti-spalling laminates. The references include polycarbonate layers, multiple layers, or thick ionomer layers for use as security glass. The critical range of the olefin dicarboxylic acid of 13-22 weight percent is not disclosed to achieve both hardness and clarity. Also, there is no anti-spalling glass layer.

As previously stated, Clock et al adds nothing to either Bolton et al references since it taught away from the use of an ionomer alone between two sheets of glass.

In recapitulation, Clock et al in Examples 1-9 finds that the use of the ionomer alone is unsatisfactory. Hopfe does not relate to an ionomer layer and teaches the combinations of regular and irregular peaks and valleys and not scoring. Murase et al does not teach ethylene-methacrylic acid copolymers. Smith and Bolton do not relate to anti-spalling laminates and are silent as to the criticality of the 13-22% by weight of the dicarboxylic acid. Consequently, the references alone or in combination would not lead one in the art to the present invention.

The present invention therefore relates to an unexpected advantage by finding a narrow percentage of the unsaturated carboxylic acid with the ionomer to provide an improvement in a crowded art.

In determining obviousness, one should consider the problems solved by the invention. The present invention solves a long term problem in clarity and strength in anti-spalling glass laminates. One should not, however, speculate on how prior laminated might be reconstructed to match the claimed structure by employing hindsight. cf. Panduit Corp. v. Dennison Manufacturing Co., 810 F2d 1561, 1 USPQ 1593 (Fed. Cir. 1987). Functional equivalence is no substitute for structural equivalence.

Furthermore, when obviousness is based on modifying the prior art, the particular modification must be based on a teaching, suggestion, or motivation found in the prior art, including the general knowledge of one of ordinary skill in the art. In re Gal, 25 USPQ 2d 1076 (Fed. Cir. 1992). None of the prior art suggests the elements of the present invention which improves the clarity feature and strength without additional additives. The Examiner may not "use the claimed invention as an instruction manual or 'template' to pieces together the teachings of the prior art so that the claimed invention is rendered 'obvious'". In re Fritch, 23 USPQ 2d 1780 (Fed. Cir. 1992). Such use would be impermissible hindsight.

Section 103 expressly mandates that the inquiry into patentability must be drawn toward the subject matter as a whole. See Connell v. Sears Roebuck & Co., 220 USPQ 193, 199 (Fed. Cir. 1983). The cited art does not suggest the critical features recited in each claim of the present application. Applicants maintain that when the reference is

viewed for their actual teaching, without knowledge of Applicants' invention, the present claims cannot be considered obvious.

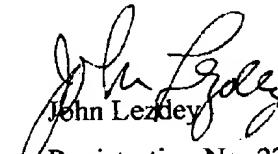
In view of the above, Applicants maintain that all points raised by the Examiner have been answered. The claims now presented are in condition for allowance.

Reconsideration and favorable action are earnestly solicited. If the Examiner still considers that there are outstanding issues in this case, he/she is requested to telephone the undersigned.

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Respectfully submitted,

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